AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF	PAGES
	1		7

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
PS09	04/26/18	EQWPMA-16-5127	

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
GSA, Office of Acquisition Repair & Alterations Division, Center 2 301 7th Street, SW, Room 6049 Washington, DC 20407 USA	WPH1AB	GSA, Office of Acquisition Repair & Alterations Division, Center 2 301 7th Street, SW, Room 6049 Washington, DC 20407 USA	WPH1AB

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

DCM ARCHITECTURE & ENGINEERING, LLC
339 N FRONT ST STE A
CAMDEN, NJ 81021
DUNS: 788771983
Cage Code: 4ME27

CODE | FACILITY CODE

(X) ☐ 9A. AMENDMENT OF SOLICITATION NO.

☐ 9B. DATED *(SEE ITEM 11)*

☒ 10A. MODIFICATION OF CONTRACT/ORDER NO. GS-11-P-16-YT-C-7173

10B. DATED *(SEE ITEM 13)* Aug 24, 2016

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

Modification Obligation Amount: $101,551.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
☐	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
☐	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
☒	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 52.243-4 Changes
☐	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Please see attached

Committed

REVIEWED
By RhondaLJackson at 3:48 pm, Apr 17, 2018

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*	16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*
Robert Benson, EXEC VP	Isaac Karto, Contracting Officer Region 11
15B. CONTRACTOR/OFFEROR (b) (6) (S	15C. DATE SIGNED 4/17/2018
16B. UNITED STATES OF AMERICA (b) (6)	16C. DATE SIGNED 04/26/2018

NSN 7540-01-1
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA FAR (48 CFR) 53.243

(b) (6)

Description of Amendment/Modification

Contract GS-11-P-16-YT-C-7173 for the Design Build to Replace Underground Hot Water Loop (NAC) is hereby modified (PS09) to add the following items to the Design-Build Hot Water Loop project at the Nebraska Avenue Complex, 3801 Nebraska Avenue, Washington, DC:

Upgrade the submitted FRP Piping to Steel Piping. The steel carrier pipe upgrade has an ASTM pressure rating of 1200psi vs. FRPs 250psi rating. The temperature rating of FRP is 300F while steel is more than 700F. The repair of steel piping requires minutes to restore as compared to the hours of cure time after a repair is made to FRP. This benefit alone would reduce outage time should a leak ever occur. The proposed use of the steel carrier piping would allow the use of an improved insulation which is not suitable for use with FRP carrier piping. The Steel pipe insulation has an R value of 25 whereas the FRP has an R value of 7. This improved insulation factor will reduce the energy consumption at the facility. The disadvantage of the steel piping is that the cost of the material is slightly greater.

Original contract amount (b) (4)
Modification AA01 (b)
Modification PS02 (b) (4)
Modification PS03
Modification PS04
Modification PS05
Modification PS06
Modification PS07
Modification PS08
Modification PS09

Revised contract amount $2,052,826.14

The period of performance completion date is hereby extended from 08/31/2018 to 10/01/2018. All other terms and conditions remain unchanged. Should you have any questions regarding this modification, please contact the Contract Specialist (michele.appello@gsa.gov), or the COR (stephen.haag@gsa.gov).

SF30 List of Accounting Strings

Accounting String	Amount Obligated
EN-GS-11-P-16-YT-C-7173.2016.192X.11.P11B0001.PG54.PG413.N20.RDC03439.DC1432NA.080.....RDC03439DC1432NA.CIPIMP.1..	(b) (4)
EN-GS-11-P-16-YT-C-7173.2017.192X.11.P11B0001.PG54.PG413.K01.RDC03608.DC1432NA.083.....	
EN-GS-11-P-16-YT-C-7173.2017.192X.11.P11B0001.PG54.PGL11.V04.RDC03690.DC1432NA.084.....	
EN-GS-11-P-16-YT-C-7173.2017.192X.11.P11B0001.PG54.PGL26.V04.RDC03690.DC1432NA.084.....	
EN-GS-11-P-16-YT-C-7173.2017.192X.11.P11B0001.PG54.PG413.N20.RDC03439.DC1432NA.080.....RDC03439DC1432NA.CIPIMP.1..	
EN-GS-11-P-16-YT-C-7173.2018.192X.11.P11B0001.PG54.PG413.N20.RDC03439.DC1432NA.080.....RDC03439DC1432NA.CIPIMP.1..	

Pencil Change Order - Mod PS09 **DATE:** 4/9/18

CONTRACT TITLE: **Contract: GS-11-P-16-YT-C-7051**

GSA NAC Design-Build Hot Water Loop

	PRIME CONTRACTOR'S WORK		Revisions/Comments
1	Direct Materials	(b) (4)	
2	Direct Labor		
3	Rental Equipment		
4	SUBTOTAL	add lines 1 - 3	
5	Prime's Overhead	% of line 4	od to work not started y
6	Prime's Profit	% of line 4	od to work not started y
7	GRAND SUBTOTAL	add lines 4 - 6	
	Prime Remarks:		

	SUB-CONTRACTOR'S WORK		Revisions/Comments
8	Direct Materials	(b) (4)	
9	Direct Labor		
10	Rental Equipment		
11	SUBTOTAL on Direct	add lines 8 - 10	
12	Sub-Contractors Overhead	% of line 11	
13	Sub-Contractors Profit	% of line 11	
14	SUBTOTAL on Direct	add lines 11 - 13	
15	2nd Tier Subcontractor Costs		
16	Overhead on 2nd Tier Subcontractor	% of line 15	
17	SUBTOTAL 2nd Tier	add lines 15 - 16	
18	GRAND SUBTOTAL	add lines 14 & 17	
	Sub Remarks:		

19	Prime Grand Subtotal	Line 7	(b) (4)
20	1st Tier Grand Subtotal	Line 18	
21	Primes Overhead on 1st Tier Sub	% of line 20	
22	GRAND SUBTOTAL	add lines19-21	
23	Primes Bond	% of line 22	
24	TOTAL COST	add lines 22 & 23	

Pencil Change Order - Mod PS09

BREAKDOWN OF DIRECT COSTS			PROJECT NUMBER	GS 11 P 16 YT C 7051	Date	9-Apr-18

	hourly	Man Day
Laborer	(b) (4)	[redacted]
Carpenter		
Electrician		
Plumber		
Pipefitter		
Sheetmetal		
Painter		
Insulator		
General Foreman		
Project Assistant		

ITEMS OF WORK FOR Prime Contractor	QTY	UNIT	MATERIAL Unit Cost	MATERIAL Total Cost	LABOR Unit Cost	LABOR Total Cost		EQUIPMENT Days	EQUIPMENT Rate	EQUIPMENT Total
							R		Total (Rental)	
DIRECT Prime Contractor's TOTALS										

ITEMS OF WORK FOR Sub-Contractor 1st Tier	QTY	UNIT	Material Unit Cost	Material Total Cost	Labor Unit Cost	Labor Total Cost	R	EQUIPMENT Days	EQUIPMENT Rate	EQUIPMENT Total
Zone 1				(b) (4) [redacted]						
Piping Areogel with Welded Steel carrier pipe;										
4" Sched 40 Blk										
3" Sched 40 Blk										
2" Sched 40 Blk										
Fittings										
Tees										
45s										
90s										
22.5s										
Welding Time										
Installation not associated with Excavation										
5 men at 40 hours per week is 200 hours										
for 3.125 weeks it is 3.125 x 200 = 625hours										
two men welding										
two men set up										
one foreman										
Steel is very heavy compared to FRP										
Sitework										
Zone 1										
Piping Dual-Guard 250 with FRP carrier pipe;										
4" EP Series 30 FRP										
3" EP Series 30 FRP										
2" EP Series 30 FRP										
Fittings										
Tees										
45s										
90s										
22.5s										
Welding Time Automated by Epoxy										
Installation not associated with Excavation										
Installation not associated with Excavation										
2 men at 40 hours per week is 80 hours										
for four weeks it is 4 x 80 = 320hours										
1 man at 40 hours per week is 40 hours										
for four weeks it is 4 x 40 = 160hours										
two men set up and glue										
one general laborer										
FRP is much lighter and less men to move										
Men can be excavating and working while glue is settin										
Sitework										
DIRECT Contractor's TOTALS				63,014.00		36,545.80				

ITEMS OF WORK FOR Sub-Contractor 2nd Tier	QTY	UNIT	Unit Cost	Total Cost
DIRECT Contractor's TOTALS				

REQUISITION/ PROCUREMENT REQUEST FOR EQUIPMENT SUPPLIES OR SERVICES *(Instructions on reverse)*

PAGE 1 OF 5 PAGES

2. REQUISITION/PROCURMENT REQUEST NO.	3. ACT NUMBER	4. DATE PREPARED	5. JOB/PROJECT NUMBER
EQWPMA-16-5127-M0019	EN-GS-11-P-16-YT-C-7173	4/17/2018	

6. TO (Stockroom/Contracting office, Name and Location)
GSA,FACILIT ES MANAGMENT & SERVICE PROGRAMS DIVISION
301 7TH STREET SW
ROOM 3660
WASHINGTON , DC 20407

7. FROM (Requisitioning office, Name, Symbol, Location and Telephone Number)
GSA,FACILITIES MANAGMENT & SERVICE PROGRAMS DIVISION
WPMA
301 7TH STREET SW
ROOM 3660
WASHINGTON , DC 20407
202.205.8950

8. FOR INFORMATION CALL *(Name and Telephone Number)*
Philip Kost - 202-401-7075

9. RECEIVING OFFICE (*Name, Symbol and Telephone Number)*
GSA,FAC LITIES MANAGMENT & SERVICE PROGRAMS DIVISION
WPMA
202.205.8950

10. ACCOUNTING CLASSIFICATION

FUND	ORG. CODE	B/A CODE	O/C CODE
FUNC CODE	C/E CODE	PROJ/POS. NO.	CC-A
W/ITEM	CC-B	PRT/CRFT SEE LINE ITEMS	

11. SHIP TO *(Address, ZIP Code and Telephone Number)*
3801 Nebraska Avenue
WASHINGTON , DC 20016

12. CONTRACT NUMBER
GS-11-P-16-YT-C-7173

ITEM NO. FORM OR STOCK NUMBER (13)	DESCRIPTIONS OF ARTICLES OR SERVICES (14)	QUAN-TITY (15)	UNIT OF ISSUE (16)	UNIT PRICE (17)	AMOUNT (18)
	See below for additional information				

IF ADDITIONAL SPACE IS REQUIRED, USE GSA FROM 49A, REQUISITION/PROCUREMENT REQUEST

19. TOTAL AMOUNT INCLUDING CONTINUATION ▶ $2,052,826.14

20a. TYPED NAME AND TITLE OF FUND CERTIFYING OFFICAL

20b. SIGNATURE ERIN MCGEE Digitally signed by ERIN MCGEE Date: 2018.04.18 10:04:53 -04'00' DATE

21a. TYPED NAME OR REQUISTIONER
Susan Mace

21b. SIGNATURE DATE

22. LIST ATTACHMENTS
Committed

23a. TYPED NAME OF APPROVING OFFICAL

23b. SIGNATURE DATE

24. SHIPPED BY
☐ FREIGHT ☐ PARCEL POST ☐ EXPRESS ☐ MAIL

25. FILLED BY	26. PACKED BY	27. CHECKED BY

28. BILL OF LADING NUMBER

29. DATE SHIPPED

REVIEWED
By RhondaLJackson at 3:47 pm, Apr 17, 2018

2. REQUISITION/PROCUREMENT REQUEST NO.	3. ACT NUMBER	4. DATE PREPARED
EQWPMA-16-5127-M0019	EN-GS-11-P-16-YT-C-7173	4/17/2018

ITEM NO., FORM OR STOCK NUMBER	DESCRIPTION OF ARTICLES OR SERVICES	QUAN-TITY	UNIT OF ISSUE	UNIT PRICE	AMOUNT
0001	DB Hot Water Loop Design/Build Replacement of Underground Hot Water Loop. Period of Performance: 120 DAYS FROM NTP WPMA-16-5127.2016.192X.11 P11B0001.PG54.PG413.N20.RDC03439 DC1432NA.080.....RDC03439DC1432NA CIPIMP.1.. Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018				(b) (4)
0002	MOD PS02 EMERGENCY UNDERGROUND HOT WA PIPE REPAIRS. Provide all materials, equipment, tools, labor and equipment to excavate and repair medium temperature hot water supply and return line. WPMA-16-5127.2017.192X.11 P11B0001.PG54.PG413.K01.RDC03608 DC1432NA.083..... Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018				(b) (4)
0003	MOD PS03 Per the scope of work, provide testing and sampling of suspected asbestos containing materials (ACM) and extend the POP 229 calendar days to				(b) (4)

2. REQUISITION/PROCUREMENT REQUEST NO.	3. ACT NUMBER	4. DATE PREPARED
EQWPMA-16-5127-M0019	EN-GS-11-P-16-YT-C-7173	4/17/2018

ITEM NO., FORM OR STOCK NUMBER	DESCRIPTION OF ARTICLES OR SERVICES	QUAN-TITY	UNIT OF ISSUE	UNIT PRICE	AMOUNT
	10/15/2017. WPMA-16-5127.2017.192X.11 P11B0001.PG54.PGL11.V04.RDC03690 DC1432NA.084..... Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018				
0004	MOD PS04 Per the scope of work, conduct abatement of Asbestos Containing Materials (ACM) and extend POP 30 days WPMA-16-5127.2017.192X.11 P11B0001.PG54.PGL26.V04.RDC03690 DC1432NA.084..... Committed (b) (4) PoP: 09/08/2016 - 08/31/2018	(b) (4)			
0005	MOD PS05 Per the scope of work, provide all labor, materials, equipment and supervision for additional cutting and breaking for trench concrete demolition and extend the POP 15 days to 11/30/2017. WPMA-16-5127.2017.192X.11 P11B0001.PG54.PG413.N20.RDC03439 DC1432NA.080.....RDC03439DC1432NA CIPIMP.1.. Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018	(b) (4)			

2. REQUISITION/PROCUREMENT REQUEST NO.	3. ACT NUMBER	4. DATE PREPARED
EQWPMA-16-5127-M0019	EN-GS-11-P-16-YT-C-7173	4/17/2018

ITEM NO., FORM OR STOCK NUMBER	DESCRIPTION OF ARTICLES OR SERVICES	QUAN-TITY	UNIT OF ISSUE	UNIT PRICE	AMOUNT
0006	MOD PS06 Per the scope of work, demo asphalt, excavate and back fill and pave asphalt. WPMA-16-5127.2017.192X.11 P11B0001.PG54.PG413.N20.RDC03439DC1432NA.080.....RDC03439DC1432NACIPIMP.1.. Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018				(b) (4)
0007	MOD PS07 Per the scope of work, provide additional concrete cutting and breaking, additional equipment, demolition effort, and special handling/recycling at the crossing of NAC17 to NAC18 and at NAC 19. WPMA-16-5127.2017.192X.11 P11B0001.PG54.PG413.N20.RDC03439DC1432NA.080.....RDC03439DC1432NACIPIMP.1.. Committed: (b) (4) PoP: 09/08/2016 - 08/31/2018				(b) (4)
0008	MOD PS08 Per the scope of work, address underground obstructions via earthwork excavation, backfill, 2" & 3" pipe work, concrete				(b) (4)

2. REQUISITION/PROCUREMENT REQUEST NO.	3. ACT NUMBER	4. DATE PREPARED
EQWPMA-16-5127-M0019	EN-GS-11-P-16-YT-C-7173	4/17/2018

ITEM NO., FORM OR STOCK NUMBER	DESCRIPTION OF ARTICLES OR SERVICES	QUAN-TITY	UNIT OF ISSUE	UNIT PRICE	AMOUNT
	removal, utility tracing, GPR services, and add delay claim. Extend POP by 274 days to 08/31/2018. WPMA-16-5127.2018.192X.11 P11B0001.PG54.PG413.N20.RDC03439 DC1432NA.080.....RDC03439DC1432NA CIPIMP.1.. Committed (b) (4) PoP: 09/08/2016 - 08/31/2018				
0009	MOD PS09 Per the scope of work, replace Zone 1 plastic pipe with Perma Pipe 750 Supreme Ins Pipe (276 LF of 2 inch pipe, 216 LF of 3 inch pipe and 500 LF of 5 inch pipe) and extend the period of performance to 10/1/2018. WPMA-16-5127.2018.192X.11 P11B0001.PG54.PG413.N20.RDC03439 DC1432NA.080.....RDC03439DC1432NA CIPIMP.1.. Committed: (b) (4) PoP: 09/08/2016 - 10/01/2018	(b) (4)			

SCOPE OF WORK

Project: NAC Hot Water Loop Replacement.
Contract: GS-11-P-16-YT-C-7173.
PRN: EQWPMA-16-5127.
Mod No: PS09 Upgrade Zone 1 to Coated Steel Pipe System.

Background

The NAC campus uses underground piping system to provide hot water to the buildings from a central boiler plant. The original underground piping over 40 years old, has degraded, and, is to be replaced under this contract. The current piping proposed to replace the original system in zone 1 is a corrosion resistant Fiberglass Reinforced Plastic (FRP) type system. In utilizing this product the facility operating engineers are limited by how much pressure and temperature they can operate the boiler plant at when pumping hot water into the FRP system. Upon further review we believe it to be in the Governments best interest to upgrade the FRP material to a coated steel carrier pipe, insulated, with PVC jacket.

Scope
Furnish all labor, materials, equipment, special handling, supervision, and administrative services to Engineer, Furnish, and Install a steel carrier pipe system in zone 1 with an ASTM pressure rating of 1200psi minimum, and a temperature rating equal to or greater than 700F. The Engineered steel pipe system shall have a minimum expected life of 45 years and have a minimum R value rating of 25.

Period of Performance:
Period of Performance is extended to Midnight July 30, 2018.

Terms & Conditions:
All other terms and conditions of the contract remain unchanged.

(End of Scope)

(b) (6)

[redacted]

MULTI–THERM® 750 SUPREME GENERAL NOTES

1.0 GENERAL

1.1 THE SCALE SHOWN ON THE DRAWINGS IS FOR REFERENCE PURPOSES ONLY. DO NOT SCALE THE DRAWINGS, USE THE DIMENSIONS SHOWN.

1.2 THE EXACT LOCATIONS AND QUANTITY OF FIELD JOINTS WILL BE SHOWN ON THE PART DRAWING LAYOUT (PDL) – SEE NOTE 5.0

1.3 THE PURCHASER MUST FURNISH AND/OR VERIFY THE FOLLOWING INFORMATION BEFORE MANUFACTURING OF THE SYSTEM CAN BEGIN:

1.3.1 FIELD MEASUREMENTS – THE ACCURACY OF FIELD MEASUREMENTS, INCLUDING WALL THICKNESS AT ALL POINTS OF ENTRY, ARE ENTIRELY THE RESPONSIBILITY OF THE PURCHASER.

1.3.2 DESIGN CONDITIONS – THE DESIGN PRESSURE, TEMPERATURE AND ALL OTHER DESIGN CONDITIONS MUST BE VERIFIED BY THE PURCHASER.

1.3.3 SLOPE OF THE SYSTEM – THE SYSTEM SLOPE IS SHOWN ON THE DRAWINGS WHERE APPLICABLE. THE SYSTEM SLOPE MUST BE VERIFIED BY THE PURCHASER.

2.0 PRODUCT DESCRIPTION

2.1 MULTI–THERM 750 PE CONDUIT IS A DRAINABLE, DRYABLE AND PRESSURE TESTABLE STEEL CONDUIT SYSTEM CONSISTING OF A SERVICE PIPE, INSULATION, AIR GAP AND PRESSURE TESTABLE STEEL CONDUIT, WITH POLYURETHANE INSULATION AND OUTER HDPE JACKET.

2.2 MULTI–THERM 750 PE IS FABRICATED TO FIELD DIMENSIONS.

3.0 DESIGN CONDITIONS/CRITERIA

3.1 SERVICE PRESSURE AND TEMPERATURE:

SERVICE	PRESSURE (PSIG)	TEMPERATURE (DEG. F)
HWS/R	200	300

3.2 THE SERVICE PIPING IS DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASME B31.1.

3.3 THE PIPING SYSTEM IS DESIGNED FOR THE ABOVE DESIGN CONDITIONS. IT IS THE PURCHASER'S RESPONSIBILITY TO VERIFY THIS INFORMATION IS CORRECT AND OPERATE THE SYSTEM WITHIN THE CONDITIONS DESIGNED FOR.

3.4 A STRESS ANALYSIS OF THIS PIPING SYSTEM HAS BEEN MADE ASSUMING THE DIMENSIONS AND DESIGN CONDITIONS SHOWN ON THESE DRAWINGS ARE CORRECT. THIS SYSTEM IS WITHIN THE LIMITS SET FORTH FOR ALLOWABLE STRESSES IN THE CODE, BASED UPON THE ASSUMPTIONS HEREIN.

3.5 THE SYSTEM IS DESIGNED TO ACCOMMODATE THE SERVICE PIPE THERMAL EXPANSION WITHIN THE CONDUIT ELBOWS AND EXPANSION LOOPS. THE CONDUIT IS SIZED TO ACCOMMODATE THIS MOVEMENT.

4.0 MATERIALS

MULTI–THERM 750 PE MATERIALS		
ITEM	SIZE	MATERIAL
SERVICE PIPE	2", 3", 4" SCH 40	ASTM A53, GR B, ERW
SERVICE PIPE FITTINGS	2" and below 2 1/2" AND LARGER	SOCKET WELD 3000# ASME B16.9 (BUTTWELD) ALSO SEE NOTE 7.1 ON THIS SHEET
SERVICE PIPE INSULATION	ALL	PYROGEL XT_E
CONDUIT	6" TO 26" 10 GAUGE	ASTM A139 SPIRAL WELDED/A135 ERW
CONDUIT INSULATION	1" THICK	POLYURETHANE 2.0 LBS/FT^3 NOMINAL DENSITY ≤ 90% CLOSED CELL
OUTER JACKET	CD ≤ 12" .120" MIN THICK 12" < CD ≤ 24" .125" MIN THICK CD ≥ 24" .150" MIN THICK CD = CONDUIT NOMINAL DIAMETER	HIGH DENSITY POLYETHYLENE (HDPE) ASTM D3350, GRADE PE345444C FIBERGLASS REINFORCED PLASTIC (FRP) CHOP SPRAYED OR HDPE ROTO–MOLD AT FITTINGS
ANCHOR, REDUCER & END PLATES	ALL	ASTM A36
SUPPORTS	ALL	GALVANIZED STEEL

5.0 INSTALLATION

5.1 ALL PIPING SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH PERMA–PIPE'S INSTALLATION INSTRUCTION MANUAL FOR THIS PRODUCT.

5.2 A PART DRAWING LAYOUT (PDL) SHALL BE FORWARDED FROM PERMA–PIPE'S FACTORY WITH EACH SHIPMENT. THE PDL INDICATES THE LOCATION OF THE FIELD JOINTS AND THE PART NUMBER OF EACH FACTORY FABRICATED PIECE. THE PDL SHALL BE USED FOR FIELD ASSEMBLY OF THE PIPING SYSTEM.

5.3 PERMA–PIPE STRONGLY RECOMMEND THAT ALL FIELD JOINTS REMAIN UNCOVERED AND EXPOSED FOR TESTING PURPOSES.

PERMA–PIPE DOES NOT RECOMMEND BACKFILLING PRIOR TO FIELD JOINT TESTING. VIOLATION OF THIS RECOMMENDATION MAY RESULT IN RE–EXCAVATION, REPAIRS AND RE–BACKFILLING AND WILL BE DONE AT THE INSTALLER'S COST AND RISK.

PERMA–PIPE WILL MAKE AVAILABLE, UPON REQUEST, TEST CAPS FOR CONDUIT TESTING.

5.4 WHERE REQUIRED, SERVICE PIPING SHALL BE COLD SPRUNG IN THE FIELD DURING INSTALLATION BY THE AMOUNT SHOWN ON THE DRAWINGS. THE AMOUNT OF COLD SPRING IS INDICATED ON THE DRAWINGS BY "CS". REFER TO THE INSTALLATION INSTRUCTION MANUAL FOR COLD SPRINGING PROCEDURES.

A WHITE STRIPE ON THE CONDUIT INDICATES COLD SPRINGING IS REQUIRED AT THE FIELD JOINT.

5.5 A BLUE STRIPE ON THE EXTERIOR OF THE CONDUIT INDICATES OVAL TYPE PIPE SUPPORTS AND MUST BE CONNECTED TO THE ADJACENT COMPENSATING PIECE.

5.6 FACTORY FABRICATED ASSEMBLIES ARE SHIPPED WITH A SHIPPING BAR WELDED TO THE SERVICE PIPE AND CONDUIT. REMOVE ALL SHIPPING BARS PRIOR TO ASSEMBLY. REMOVAL OF SHIPPING BARS IS THE RESPONSIBILITY OF THE INSTALLER.

5.7 ANCHOR BLOCKS ARE REQUIRED AT ALL ANCHOR LOCATIONS INDICATED ON THE DRAWINGS. ANCHOR BLOCKS SHALL BE FIELD POURED AND KEYED INTO UNDISTURBED SOIL BY OTHERS. ALL ANCHOR BLOCKS SHALL BE COMPLETELY CURED BEFORE OPERATING OR TESTING THE SYSTEM.

6.0 FACTORY TESTING AND INSPECTION

6.1 THE SERVICE PIPE SHALL BE HYDROSTATICALLY OR NDE TESTED BY THE PIPE MANUFACTURER IN ACCORDANCE WITH ITS RESPECTIVE ASTM DESIGNATION.

6.2 SERVICE PIPE NDE IN ACCORDANCE WITH ASME B31.1.

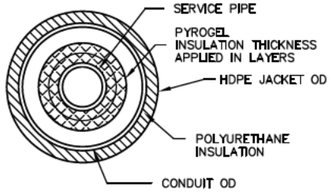
6.3 ALL FACTORY CONDUIT WELDS SHALL BE PNEUMATICALLY (AIR) TESTED TO 10 PSIG.

6.7 VISUALLY INSPECT SPRAY APPLIED POLYURETHANE INSULATION FOR VOIDS PRIOR TO TO HDPE JACKETING.

7.0 SPECIAL REQUIREMENTS

7.1 CHANGES IN DIRECTION MAY BE ACHIEVED THROUGH THE USE OF WELDED FITTINGS AND/OR THE BENDING PROCESS IN ACCORDANCE WITH THE CODE FOR PRESSURE PIPING B31.1 LATEST EDITION.

NOTES:
1. HDPE JACKET OD MAY BE DIFFERENT AT MULTITHERM 500 PE TERMINATION ENDS (END SEALS AND GLAND SEALS) WHERE PIPING PENETRATES WALLS OR FLOORS. SEE WALL ENTRY DETAILS FOR THE CORRECT OD AT THESE LOCATIONS.



MULTI–THERM 750 PE CROSS SECTION				
SERVICE	SERVICE PIPE	INSULATION THICKNESS	CONDUIT OD	HDPE JACKET OD (SEE NOTE)
2" HWS/R	2" SCH.40 A53 GRADE B ERW STEEL	.394"	6 5/8"	8.90"
3" HWS/R	3" SCH.40 A53 GRADE B ERW STEEL	.591"	6 5/8"	8.90"
4" HWS/R	4" SCH.40 A53 GRADE B ERW STEEL	.591"	8 5/8"	10.90"

REV	DATE	REVISION	BY	APPR.
0	.	INITIAL ISSUE	.	.

PERMA–PIPE / RICWIL
PERMA–PIPE, INC.
A SUBSIDIARY OF MFRI, INC.
7720 LEHIGH AVE. NILES, IL 60714
MANUFACTURING FACILITY
1310 QUARLES DR. LEBANON, TN 37087

ENERGY DISTRIBUTION SYSTEM

FOR

MULTI–THERM 750 PE
GENERAL NOTES

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DRAWING NO. MTP–0010
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SHEET 1 OF 2
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